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Crystallized phenol treatment is a good alternative for the pilonidal disease in teenagers

Crystallized phenol in teenage pilonidal disease

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Abstract

Aim: Although many surgical procedures have been tried, the best treatment option remains controversial in teenagers. The purpose of this study was to assess the long- term outcomes of crystallized phenol therapy in the treatment of pilonidal sinus disease in teenage patients.

Material and Methods: A retrospective review from 1996 to 2019 of teenagers with pilonidal disease undergoing crystallized phenol treatment for primary pilonidal disease was performed. Data collection included demographics, features of sinus, total procedures performed, healing time, recurrence, follow-up time and the last status of patients over a twenty- year period.

Results: A total of 235 teenagers with pilonidal disease (162 boys, 73 girls) with a mean age of 16.32 (range 12–18) years who were reached during the study period were evaluated. The overall success rate was 73.61% in long- term period. It was determined that the recurrence rate was higher in patients with multiple sinus orifices at admission, more CPT sessions, and a longer recovery period (p=0.01, p=0.03, and p=0.02, respectively). It was observed that the predisposing factors accused in the etiology of pilonidal disease had no effect on recurrence after treatment (p>0.05).

Discussion: Crystallized phenol treatment has also been successful in long-term folow-up in teenage patients. It can be safely used as the first option in the treatment of pilonidal disease in the teenage population too.

Keywords

Pilonidal Disease, Crystallized Phenol, Teenage, Risk Factors, Nonoperative Treatment

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Introduction

Pilonidal disease (PD) is a benign, chronic, inflammatory disease of the skin located especially in the sacrococcygeal region. Although it is common in adult males, it is also seen in teenagers [1-6]. In adults, being overweight, excess hair in the intergluteal cleft, prolonged sitting times, family history and poor hygiene are acknowledged as predisposing factors [7,8]. Although the idea of an acquired theory in PD etiology is accepted today, it is unclear whether congenital theory or acquired factors have an effect on the increase of PD in teenagers.

PD treatment remains a mystery in teenagers, as does its etiology. Due to the limited number of studies on the treatment of PD in teenagers, they are generally treated according to the principles of adult treatment. Currently, wide local excision with or without flap technique is recommended most [9-,12]. Therefore, some authors argue that surgery is necessary at an early age due to the fact that long-term risk rates in teenagers are higher [13]. But, these therapies can result in significant morbidity, long healing times, and a high risk for recurrence. More recently, minimally invasive techniques, including fibrin glue obliteration [9,14], minimal excision [15], and crystallized phenol [4] have been described in teenagers. These treatments reportedly offer quicker healing and return to normal activities with acceptable recurrence rates. However, long-term follow-up data are not available. We have used crystallized phenol application in adults for a long time as a nonoperative treatment method that can be easily applied with minimal complications and had very successful results in both primary and recurrent PD treatment [16,17]. We have applied this method, which is successful in both adults and teenagers. We could not find large series with long-term follow-up of the treatment of PD with crystallized phenol treatment (CPT) in teenagers in the literature.

In this study, we aimed to present the long-term results of our crystallized phenol application, the efficiency of CPT and predisposing factors in a wide case series in teenagers aged 12-18 years with PD.

Material and Methods

Patient Selection

The records of 415 PD patients aged 12-18 years who underwent CPT between March 1996 and February 2019 were evaluated. These prospectively collected data were analyzed retrospectively. Patients who were followed for less than one year (N= 135) were excluded from the study considering that true recurrences cannot fully develop within such a short period of time. Furthermore, 45 out of 415 patients previously operated using any technique but had postoperative recurrent PD (N=41) and those who could not complete or discontinued their treatment for any reason (N=4) were excluded from the study. For this reason, 235 patients were included in the study (Figure 1: flowchart).

Study Design

This study was performed in accordance with the declaration of the Helsinki Protocol. This study was approved by the institutional review board at KTO Karatay University, Medical School, Konya, Turkey (IRB no. 2021/007). An informed consent form was obtained from the legal guardians of all patients. The teenage patients diagnosed with PD were evaluated with regard to family history of PD, body mass index (BMI, kg/m2), skin tone, pilosity levels, smoking history, and time spent sitting per day.

The presence of PD was investigated in the first and second-degree relatives of the patients to identify any family history. The patients were categorized into two groups according to the presence or absence of a family history of PD. Skin tone evaluations of all patients were performed visually based on the Fitzpatrick scale [18]. The parents of the patients were asked to record the time spent sitting per day. Accordingly, the patients were categorized into two groups: sitting for less than 6 hours or more than 6 hours a day.

The presence of purulent discharge from the sinus orifice and the presence of signs of inflammation or abscess formation in this area were evaluated as acute PD. The presence of serous discharge from the sinus orifice and the absance of signs of inflammation and abscess formation were evaluated as chronic PD. It was investigated whether the factors mentioned above affect the number of CPT applications, healing time and recurrence.

Crystallized Phenol Application

Crystallized phenol treatment was performed as described by Dogru et al. [17], who first described and applied it. The day before the procedure, patients were asked to clean hairs from the waist to the middle of the thigh with depilatory creams or epilation. The patients were admitted in a prone position. After local anesthesia around the sinus holes, the sinus was entered with a thin mosquito clamp and the hairs in the sinus were removed. The skin was covered with nitrofurantoin pomade (Furacin, Eczacıbaşı İlaç San ve Tic. A.S., İstanbul, Turkey) in order to prevent skin irritation. Crystallized phenol with the same clamp was filled into the sinus hole until the sinus cavity was filled. All procedures were outpatient. No patients were given antibiotics and analgesic treatment.

Follow-up

Patients were called for control with an interval of 3-week. The closing of the sinus hole and the complete disappearance of the discharge were considered healing. After the treatment of the patients was finished, their annual follow-up was performed. All patients were offered hair removal of the sacrococcygeal area once a month for 6 years. Reopening the previously closed sinus openings at least 6 months later was considered a recurrence. If the sinus openings were reopened in less than 6 months, the treatment failure was accepted, and CPT application was continued. All patients were contacted by e-mail or phone and asked whether they had, recurrence, treatment at another institution or the last status of their disease in February 2019. Patients who could not be reached in either way were evaluated according to their records at the last admission.

Statistical Analysis

Mean, standard deviation, median, lowest, highest, frequency and ratio values were used in the descriptive statistics of the data. The distribution of variables was measured by the Kolmogorov-Smirnov test. The Mann-Whitney U and the Kruskal-Wallis tests were used to analyze quantitative independent data. The Chi-square test was used in the analysis of qualitative independent data. A multiple logistic regression model was implemented to

determine the independent variables associated with PD. SPSS 22.0 packed program was used in the analysis.

Results

In this study, we presented data of 235 patients whose records were completely accessible. The mean age of the patients was 16.32 (range, 12-18) and the majority were males (68.9%). All patients were discharged on the same day. Five (2.85%) patients were treated with topical therapy because of irritation at the wound site. No major complications were observed in any patient.

The mean follow-up time was 37.36 (range, 12-235) months. The majority of patients had chronic sinus presentation (90.2%) and a mean number of CPT sessions was 2.1 (range, 1-10). Although one session of CPT was sufficient in half of the patients, only 8.9% needed 5 or more CPT sessions.

One hundred thirty-one (55.7%) patients continued their lives without any problems after CPT. In addition, there were 22 (9.36%) patients who could not be reached but no recurrence was observed during their follow-up period. The mean follow-up period of these patients who could not be reached was 31.50 ± 22.19 (13-93) months.

The disease recurred in 82 (34.8%) patients, 20 (24.39%) of whom were applied re-CPT and now have no problems, 18 (21.95%) preferred surgery after recurrence. Thirty three (40,2%) patients with recurrence did not accept retreatment and 11 (13,4%) patients were excluded from follow-up voluntarily (Figure 1). Thus, the number of patients who we were administered successfully was 173 (131+22+20). Our success rate was 73.61%.

Crystallized phenol treatment was re-applied to patients who relapsed after CPT and accepted re-treatment. After the first recurrence, 13 patients refused re-CPT and preferred to undergo surgery, in 20 patients re-CPT application was continued. Among 20 patients, 6 patients experienced a second recurrence and 1 patient experienced a third recurrence and they were treated with re-CPT succesfully. Despite the recurrence, we achieved success in all patients, we continued CPT. The mean number of recurrences was 1.22 (1-3). Every recurrence required fewer CPT sessions. We observed that 92.6% of recurrences were in the first 5 years; 7.3% of them were between 5-10- year period. No recurrence was observed in 27 patients who were followed up 10 years later.

The predisposing factors in PD etiology and demographic data of patients are seen to affect recurrence after CPT (Table 1). Recurrence was higher in male patients (OR: 0,501, 95%CI 0,27-0,93, p=0.01). It was observed that the predisposing factors accused in PD etiology had no effect on recurrence after CPT (p>0.05). We performed a multivariable logistic regression analysis (with the predisposing factors being recurrence), and the possible predictive variables were age and sex. None of these variables excluding sex were predictive of recurrence (95% CI 0.05–1,89, p = 0.06).

Table 2 shows relationship between sinus features, CPT

Table 1. The effects of demographic data, habits and duration of the disease on recurrence

Demographic Data		Recurrence (-)		Recurrence (+)		P
		Mean±SD	Median	Mean±SD	Median	
Age		16,41±1,43	17	16,17±1,39	16	0,119[m]
BMI		24,42±3,74	24,37	24,39±3,86	23,87	0,817[m]
Duration of disease (Month)		8,62±12,81	5	10,74±21,15	5,5	0,261[m]
		Mean±SD	N-%	Mean±SD	N-%	
Gender	Male	98	60,50%	64	39,50%	0,028 X^2
	Female	55	75,30%	18	24,70%	
BMI	<30	143	65,90%	74	34,10%	0,601 X^2
	≥30	10	58,80%	7	41,20%	
Smoking Status	None	139	67,10%	68	32,90%	0,091 X^2
	Yes	14	50,00%	14	50,00%	
Time spent sitting	None	30	71,40%	12	28,60%	0,474 X^2
	Yes	123	64,10%	69	35,90%	
Skin tone	Whiter	95	65,50%	50	34,50%	0,889 X^2
	Darker	58	64,40%	32	35,60%	
Pilosity levels	Mild	24	70,60%	10	29,40%	0,467 X^2
	Moderate	75	61,50%	47	38,50%	
	Severe	54	68,40%	25	31,60%	
Family history	None	80	69,00%	36	31,00%	0,273 X^2
	Yes	73	61,30%	46	38,70%	
Sinus presentation	Chronic	151	63,2%	61	36,8%	0,069 X^2
	Acute	20	82,6%	3	17,4%	

m Mann-Whitney u test / X^2 Chi-Square test, Min: Minimum, Max: Maximum, SD: Standard Deviation, N: Number, CPT: Crystallized Phenol treatment

Table 2. The characteristics of sinus, some etiologic factors related with pilonidal disease, follow-up duration, number of application and healing time and their effects on recurrence.

	Recurrence (-)		Recurrence (+)		P
	Mean±SD	Median	Mean±SD	Median	
Number of primer openings	2,81±1,89	2	3,73±3,11	3	0,01m
Number of seconder openings	0,28±0,53	0	0,38±0,51	0	0,06 m
Followup duration (Month)	39,41±30,07	31	33,54±17,02	31	0,373m
Number of application	1,98±1,53	1	2,41±1,89	2	0,03 m
Healing Time (week)	5,89±5,25	3	7,94±7,8	6	0,02 m

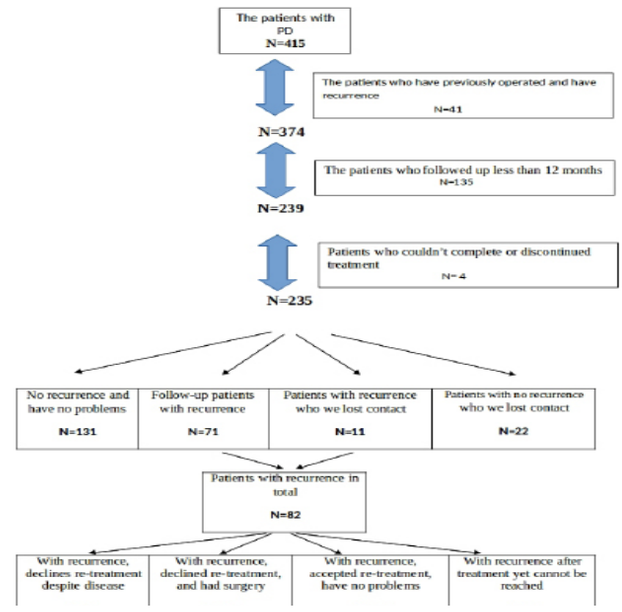

Figure 1. Flowcharts

application and follow-up time with recurrence. It was determined that the recurrence rate was higher in patients when number of primary opening before CPT, the number of CPT applications and healing time were high. (respectively, p=0.01, p=0.03, p= 0,02).

Discussion

Although PD is common in adults, it is not uncommon in teenagers [19,20]. However, there are very few studies on PD and its treatment in teenagers [1-6]. All these studies have low quality and risk of bias due to the small number of participants and the short follow-up period [9]. In one of these studies that reported a 2-year follow-up of off-midline flap methods, the recurrence rate was 8% in teenagers [9]. However, the recurrence rate was reported to be between 1-6.7% in long-term follow-up in adults. [18]. Although it is known that the recurrence rates of sinus excision and open healing methods were lower compared to flap methods in adults, it has been reported that the recurrence rates of open healing methods were higher than flap methods in teenagers [21]. These results thought that PD has a different progression in teenagers than in adults. Therefore, we planned this study to evaluate the long-term results of the CPT method, which has successful results in adults, in teenagers. This study has the longest follow-up period and the largest number of case series on PD treatment in teenagers to date.

Doğru et al, who first applied CPT in the treatment of PD in adults, reported a success of 84.3% in 20 years of follow-up [17]. Ates et al. who first mentioned the results of CPT in the treatment of PD in teenagers to date, reported that recurrence rate in 40 patients who underwent CPT during a mean follow-up of 8 months was 2.5% [4]. Moreover Gulpinar et al. reported a case report with a short follow-up that crystallized phenol application in adolescence pilonidal disease seems to be a promising non-operative therapy [22]. However, longer follow-up periods are needed to determine the right recurrence rates in PD. For this reason, our study is the first study that evaluated the result of CPT in teenagers with the highest number of patients and the longest follow-up period.

In this study, our 20-year success rate was determined as 76.5%. This success rate belongs to the group of patients who never quit our treatment and are compatible with us. Patients who did not come to treatment after recurrence of PD or refused our treatment and preferred surgery were evaluated as the groups in which we failed. Although our first recurrence rate after CPT was 33.1%, we achieved success in all of the patients we applied CPT again after recurrence. If the patients in the unsuccessful group (patients who did not continue treatment or preferred surgery) continued their treatment, our success rate would be probably higher. We did not recommend surgery to any of our patients with recurrence after CPT because CPT can be easily applied again in recurrences after CPT, and the number of applications decreases more after each recurrence as seen in our study. For this reason, we believe that it would be appropriate to consider the treatment of recurrent cases with CPT after CPT. It has been reported in the literature that the recurrence rate after PD surgery in teenagers was between 13-28% [1,4,6]. Our total recurrence rate is 22.8 and it is similar to the surgical results in the literature. In addition, we have no major complication as it is seen in surgeries.

Our success rate of single session CPT in the treatment of PD was 49.7%. Recurrence was observed in 25% of these patients during their follow-up. The success of a single session of phenol administration has been reported between 64-70% in adults [23]. But a pseudo-membrane sometimes forms in the sinus orifice after one session of CPT, which may mislead the clinician according to our experience. Therefore, we applied re-CPT by reopening the sinuses orifice where we saw pseudo-membranes. In our study, we think that single-session CPT is not an appropriate method, since it has achieved more than 90% success in 4 or more applications. It has been reported that the incidence of PD in teenagers is similar between men and women, unlike adults [3,5]. However, in our study, the male to female ratio was 2,2:1. We think that this is because it is difficult for women to apply to the doctor with this complaint due to local cultural characteristics in our region. In addition, more recurrences were observed after CPT in male patients

Despite these high success rates of CPT applications, some clinicians are hesitant about the use of crystallized phenol, especially in the pediatric population, for concerns of toxic effects such as muscle weakness, convulsions and coma. However, we did not encounter any of the toxic effects in any of our patients in this series. Therefore, we think that CPT can be also applied safely in the pediatric population. In addition, there is no evidence in the literature regarding the toxic effects of CPT used in the treatment of PD in the pediatric population.

The study had some limitations. Since it has a 20-year follow-up period, 13.1% of the patients were out of follow-up and the patients could not be reached. In addition, the CPT that we apply to all patients without using a classification for PD shows a heterogeneous distribution because it contains the results.

Conclusion

CPT application, which is successfully applied in the treatment of PD in adults, has been observed to be successful in the long term in teenagers. Since CPT is inexpensive, can be applied as outpatient, is a non-invasive procedure, has comparable results to surgical procedures, and does not cause loss of work for patients, it can be safely applied as the first option in the treatment of PD in teenagers. Even in relapses after CPT, repeated CPT application should be considered before making a surgical decision.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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